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Bidisperse Shrinking Core Model for Supercritical Fluid Extraction

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Abstract

© 2015 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim. The broken-and-intact-cell model is conventionally used for interpretation of overall extraction curves (OECs) observed in supercritical fluid extraction (SFE) of ground oilseeds. Another possibility, considered here, assumes that the packed beds of the ground material always contain a significant amount of very small particles, i.e., dust, which control the initial extraction rates. The bidisperse representation of particle ensembles allows accurate description of OECs on the basis of the modified shrinking core model. A simple asymptotic solution has been derived for bidisperse granulometric distributions under typical SFE conditions. Special microscopic observations have been performed to reveal and examine the dust fraction in ground seed substrates.

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Keywords

Bidisperse granulometric distribution, Polydisperse packed bed, Shrinking core model, Supercritical fluid extraction